Space Weather Forecast

Issued on Saturday, 09 July 2022 at 13:04 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Chance of further moderate class X-ray flares and R1 Radio Blackouts.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity rose sharply to become moderate in the past 24 hours, with a long-period moderate class X-ray flare recorded from the largest and most complex sunspot on the facing side at 08/2048UTC. Background activity level is now slightly higher than it was 24 hours ago.

There are five sunspot regions on the visible disc. The largest and most complex one is the group that produced the recent moderate-class flare, located in the northeast quadrant. Another group, located in the southeast quadrant is also growing in size and complexity whereas the others remain smaller and simpler.

There are currently numerous large 'filaments' on the Sun (arcs of plasma, potentially CMEs should they erupt), with the southeast of the Sun in particular harbouring two large features that each span roughly 20 degrees. There were no signs on instability in these in the reporting period, however they will become increasingly relevant should they lift off in the coming few days and will be monitored. Other areas of note included the southwestern solar horizon, which saw a non-Earth directed 'prominence' lift-off (arc of plasma from the sun's edge).

The large M-class flare was a long-period one and showed some dimming in some extreme UV imagery, both of which often preceded the release of a CME. A CME was indeed visible on satellite imagery but its analysis revealed that it is not Earth-directed and passing East of the Sun-Earth line. No Earth-directed CMEs have been observed in available imagery over the past 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind showed some residual CME influences initially, followed by a return to a nominal regime. The solar wind speed decreased from 410 to 350 km/s. The magnitude of the magnetic field was Moderate initially but became slowly weak over time, with no significant fluctuations on the important north-south component. The net effect of the above solar wind measures was an overall decreasing geomagnetic activity, from Quiet and Unsettled to increasingly Quiet.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to remain low, but with a daily chance of moderate-class flares. A progressive slight increase is possible in the four days, as while no significant sunspot regions leave the Earth-facing side, up to two may return over the eastern solar horizon.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.

Met Office

Space Weather Forecast

Solar Wind / Geomagnetic Activity: The glancing blow that was expected from the CME that left the Sun on 05 July is now considered very unlikely. No other CMEs feature in this forecast Solar winds are expected to be slow-ambient initially, before becoming slightly elevated on day 3 or even elevated on day 4, under the influence of the high speed stream from a large but fragmented coronal hole. Geomagnetic activity should therefore be largely Quiet with the odd Unsettled interval on days 1 and 2 (09th and 10th), but Quiet to Active on days 3 and 4 (11th and 12th) with a Slight Chance of a G1/Minor Storm on day 3 (11th), at the onset of the HSS.

Energetic Particles / Solar Radiation: In the absence of any significant sunspot development, solar radiation storms are not anticipated, however there is a very slightly rising tendency with the usual westward progression of the front-side large sunspot groups.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.

Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.